

CLAIMS

1. Method for detecting a signal burst transmitted on the initiative of a sender on a radio channel listened to by a receiver system, the transmitted burst representing a predetermined digital sequence, in which method channel parameters representing a statistical behaviour of the radio channel are estimated and a detection magnitude is evaluated on the basis of the estimated channel parameters and of a correlation between a signal received at the receiver system and the predetermined digital sequence, wherein the detection magnitude is compared with an adaptive detection threshold to decide whether the signal burst is detected.

2. Method according to Claim 1, in which a false detection rate for the burst is estimated, over an observation period, and the adaptive detection threshold is varied as a function of the estimated false detection rate.

3. Method according to Claim 2, in which the estimation of the false detection rate for the burst comprises a countdown of a number of signalling procedures which begin with the detection of a burst during the observation period and which do not complete.

4. Method according to Claim 1, in which, over an observation period, a ratio of a probability of transmission of the burst by a sender to a probability of absence of transmission of the burst is estimated.

5. Method according to Claim 4, in which the estimation of the probability ratio comprises a countdown of the number of detections of the burst during the observation period.

6. Method according to Claim 1, in which said estimated channel parameters comprise moments of order greater than 2 of the gain on the radio channel.
- 5 7. Method according to Claim 6, in which said estimated channel parameters comprise moments of order 0 to k of the gain on the radio channel, where k is an integer larger than 2.
- 10 8. Method according to Claim 6, in which the signal received is subjected to a filtering matched to the predetermined digital sequence so as to obtain said correlation in the form of a complex signal having a first component on an in-phase path and a second 15 component on a quadrature path.
9. Method according to Claim 8, in which the evaluated detection magnitude is proportional to
- $$\left(\sum_{n=0}^k \frac{1}{n!(\sqrt{N_0})^n} H_n\left(\frac{z_x}{\sqrt{N_0}}\right) m_{x,n} \right) \left(\sum_{n=0}^k \frac{1}{n!(\sqrt{N_0})^n} H_n\left(\frac{z_y}{\sqrt{N_0}}\right) m_{y,n} \right), \quad \text{where } N_0$$
- denotes the estimated power of the noise on the radio 20 channel, z_x and z_y denote said first and second components, $m_{x,n}$ and $m_{y,n}$ denote the moments of order n of the gain on the in-phase path and on the quadrature path respectively, H_n denotes the Hermite polynomial of order n and k is an integer larger than 2.
- 25 10. Method according to Claim 1, in which said sender is a mobile terminal, said receiver system belongs to a radiocommunication network and in which said burst is sent so as to request access to the network.
- 30 11. Receiver system able to detect a signal burst transmitted on the initiative of a sender on a radio channel listened to by the receiver system, the transmitted burst representing a predetermined digital sequence, comprising means of estimating channel 35 parameters representing a statistical behaviour of the

- radio channel, means of evaluating a detection magnitude from the estimated channel parameters and a correlation between a signal received at the receiver system and the predetermined digital sequence, means of 5 comparing the detection magnitude with a detection threshold to decide whether the signal burst is detected, and means for adapting the detection threshold.
- 10 12. Receiver system according to Claim 11, furthermore comprising means of estimating, over an observation period, a false detection rate for the burst, in which the adaptation means comprise means for varying the detection threshold as a function of the estimated 15 false detection rate.
13. Receiver system according to Claim 12, in which the means for estimating the false detection rate comprise countdown means for metering a number of 20 signalling procedures which begin with the detection of a burst during the observation period and which do not complete.
14. Receiver system according to Claim 11, furthermore 25 comprising means of estimating, over an observation period, a ratio of a probability of transmission of the burst by a sender to a probability of absence of transmission of the burst.
- 30 15. Receiver system according to Claim 14, in which the means for estimating the probability ratio comprise countdown means for metering the number of detections of the burst during the observation period.
- 35 16. Receiver system according Claim 11, comprising at least one base station and a base station controller, in which the means for estimating channel parameters, the means for evaluating the detection magnitude and the means of comparison form part of the base station,

while a part at least of the adaptation means forms part of the base station controller.

17. Receiver system according to Claim 16, in which
5 the base station controller comprises means for transmitting messages for adjusting the detection threshold to the base station.

18. Receiver system according to Claim 11, in which
10 said estimated channel parameters comprise moments of order greater than 2 of the gain on the radio channel.

19. Receiver system according to Claim 18, in which
said estimated channel parameters comprise moments of
15 order 0 to k of the gain on the radio channel, where k is an integer larger than 2.

20. Receiver system according to Claim 18, comprising
means of filtering, matched to the predetermined
20 digital sequence, to which the signal received is subjected to obtain said correlation in the form of a complex signal having a first component on an in-phase path and a second component on a quadrature path.

25 21. Receiver system according to Claim 20, in which the evaluated detection magnitude is proportional to

$$\left(\sum_{n=0}^k \frac{1}{n!(\sqrt{N_0})^n} H_n \left(\frac{z_x}{\sqrt{N_0}} \right) m_{x,n} \right) \left(\sum_{n=0}^k \frac{1}{n!(\sqrt{N_0})^n} H_n \left(\frac{z_y}{\sqrt{N_0}} \right) m_{y,n} \right), \quad \text{where } N_0$$

denotes the estimated power of the noise on the radio channel, z_x and z_y denote said first and second components, $m_{x,n}$ and $m_{y,n}$ denote the moments of order n 30 of the gain on the in-phase path and on the quadrature path respectively, H_n denotes the Hermite polynomial of order n and k is an integer larger than 2.

22. Receiver system according to Claim 11, in which
35 said sender is a mobile terminal, said receiver system belongs to a radiocommunication network and in which

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said burst is sent so as to request access to the network.